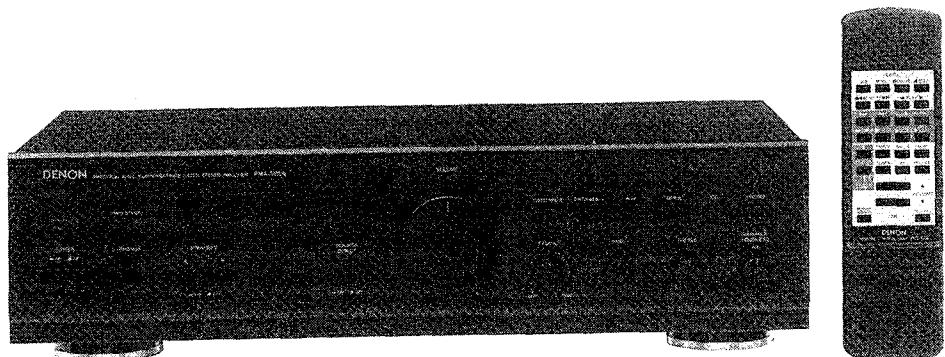


# DENON

SMPMA525R - Z16  
S.MANUAL PMA525R  
-1-

Hi-Fi Integrated Stereo Amplifier

## SERVICE MANUAL MODEL PMA-525R INTEGRATED STEREO AMPLIFIER



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**NIPPON COLUMBIA CO., LTD.**

## SAFETY INSTRUCTIONS



RISK OF ELECTRIC SHOCK  
DO NOT OPEN

**CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER SERVICE-ABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED PERSONNEL.**

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated 'dangerous voltage' within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

**WARNING:** TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

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## **ATTENTION**

POUR PREVENIR LES CHOCS ELECTRIQUES NE PAS UTILISER CETTE FICHE POLARISEE AVEC UN PROLONGATEUR UNE PRISE DE COURANT OU UNE AUTRE SORTIE DE COURANT, SAUF SI LES LAMES PEUVENT ETRE INSEREEES A FOND SANS EN LAISSER AUCUNE PARTIE A DECOUVERT

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## CAUTION

**TO PREVENT ELECTRIC SHOCK DO NOT USE THIS (POLARIZED) PLUG WITH AN EXTENSION CORD, RECEPTACLE OR OTHER OUTLET UNLESS THE BLADES CAN BE FULLY INSERTED TO PREVENT BLADE EXPOSURE.**

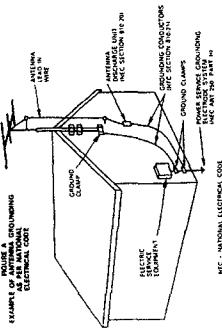
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Andaman Islands

Die DENON Electronic GmbH

erklärt als Hersteller/Importeur, daß das in dieser Bedienungsanleitung beschriebene Gerät den Technischen Vorschriften für Ton- und Fernsprech-Rundfunkempfänger nach der Amtsblattverfügung 868a/1939 (Amtsblatt des Bundesministers für Post und Telekommunikation vom 31.8.1939) entspricht.

1. Read Instructions – All the safety and operating instructions should be read before the appliance is operated.
  2. Retain Instructions – The safety and operating instructions should be retained for future reference.
  3. Heed Warnings – All warnings on the appliance and in the operating instructions should be adhered to.
  4. Follow Instructions – All operating and use instructions should be followed.
  5. Water and Moisture – The appliance should not be used near water – for example, near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool, and the like.
  6. Carts and Stands – The appliance should be used only with a cart or stand that is recommended by the manufacturer.
  7. An appliance and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the appliance and cart combination to overturn.
  8. Ventilation – The appliance should be situated so that its location or position does not interfere with its proper ventilation. For example, the appliance should not be situated on a bed, sofa, rug, or similar surface that may block the ventilation openings; or placed in a built-in installation, such as a cabinet or built-in wall unit, installation, such as a brookline or cabinet that may impede the flow of air through the ventilation openings.
  9. Heat – The appliance should be situated away from heat sources such as radiators, heat registers, stoves, or other appliances (including amplifiers) that produce heat.
  10. Power Sources – The appliance should be connected to a power supply only of the type described in the operating instructions or as marked on the appliance.
  11. Grounding or Polarization – Precautions should be taken so that the grounding or polarization means of
  12. Power-Cord Protection – Power-supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the appliance.
  13. Cleaning – The appliance should be cleaned only as recommended by the manufacturer.
  14. Power Lines – An outdoor antenna should be located away from power lines.
  15. Outdoor Antenna Grounding – If an outside antenna is connected to the receiver, be sure the antenna system is grounded so as to provide some protection against voltage surges and built-up static charges. Article 810 of the National Electrical Code, ANSI/NFPA 70, provides information with regard to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna-discharge unit, size of grounding conductors, location of antenna-discharge unit, connection to grounding electrodes, and requirements for the grounding electrode. See Figure A.
  16. Nonuse Periods – The power cord of the appliance should be unplugged from the outlet when left unused for a long period of time.
  17. Objects and Liquid Entry – Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through openings.
  18. Damage Requiring Service – The appliance should be serviced by qualified service personnel when:
    - A. The power-supply cord or the plug has been damaged; or
    - B. Objects have fallen, or liquid has been spilled into the appliance; or
    - C. The appliance has been exposed to rain; or
    - D. The appliance does not appear to operate normally or exhibits a marked change in performance; or
    - E. The appliance has been dropped, or the enclosure damaged.
  19. Servicing – The user should not attempt to service the appliance beyond that described in the operating instructions. All other servicing should be referred to qualified service personnel.





CONNECTIONS  
ANSCHLÜSSE  
CONNEXIONS  
CONNESSIONI

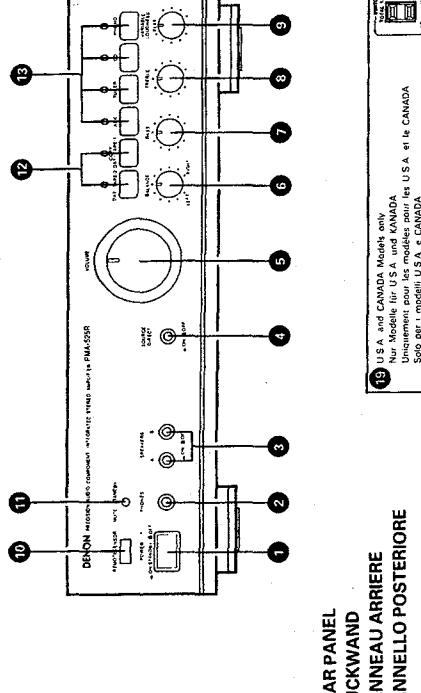


Fig. 1  
Abb. 1

**LINe VOLtAGE (Voltage select switch) . . . For  
Multi-voltage model only**

The LINE VOLtAGE selector switch on the back panel allows you to select the voltage required by your KENWOOD receiver. The LINE VOLtAGE SELECTOR is located on the back panel using a screw driver. Do not twist the VOLtAGE SELECTOR DO NOT twist the VOLtAGE SELECTOR KNOB with excessive force. It may be damaged. The voltage select switch does not turn smoothly, see qualified service personnel.

GND		④ PHONO	① CD, TUNER, AUX	① DAT, TAPE-1, DAT, TAPE-2 • TAPE PS, • TAPE REC	② SPEAKERS
GND		Phono input Terminal (Pin 9)	Input Terminal (CD, TUNER, AUX)	Phono and recording terminals Recording terminals	Speaker Terminals
GND		Schaltterminalstecker- Eingangskontakt Protocol	Eingangskontakt (CD, TUNER, AUX)	Tonband/Einspeisung Wiedergabe	Lautsprechers- ausgang
GND		Bornes d'entrée (phone)	Bornes d'envoie (CD, TUNER, AUX)	Aufnahme • Aufnahme	Bornes de haul- parleurs
GND		Terminal di ingresso Phone	Terminal di ingresso (CD, TUNER, AUX)	Bornes di lettura e d'ingresso • Bornes de sécurité	Bornes de haul- parleurs
GND				Terminal di riproduzione e registrazione • Terminal di registrazione	Terminali di ripro- duzione

FRONT PANEL  
FRONTPLATTE  
PANNEAU AVANT  
PANNELLO ANTERIORE

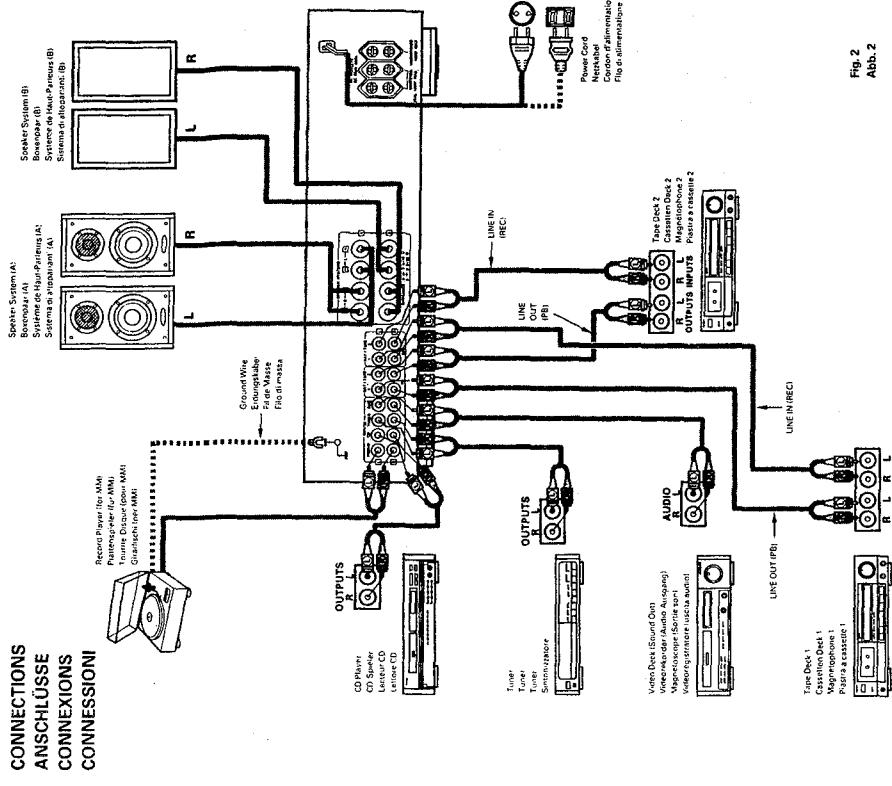


Fig. 2  
Abb. 2

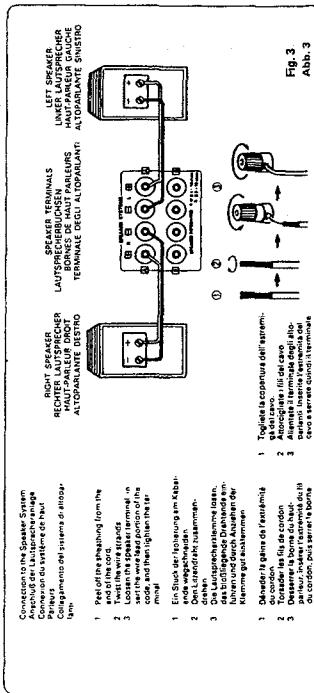


Fig. 3  
Abb. 3

## DESIGNATIONS AND FUNCTIONS OF PANEL CONTROLS

- ① POWER (Power Switch)**  
When the power switch is turned ON (▲), the MUTE/STANDBY LED (1) lights.  
When the power switch is turned ON, power is supplied to the unit. It takes a few seconds after the power is turned on for the unit to warm up. This is due to the built-in muting circuit that eliminates noise during the on/off operation.
- ② PHONES (Headphone Jack)**  
This jack is used to plug in the headphones.
- ③ SPEAKERS (Speaker Selection Switch)**  
The PMA-525R can be connected to two speaker systems: speaker system A and speaker system B.  
When A is pressed, the speaker system connected to speaker output terminals A operates.  
When B is pressed, the speaker system connected to speaker output terminals B operates.  
When A and B are pressed on together, both speaker systems operate simultaneously. When the A and B switches are both off (in the out position), there is no output from the speaker terminals. This setting is used to listen to playback through the headphones.
- ④ SOURCE DIRECT (Source Direct Switch)**  
The controls (BALANCE, VARIABLE LOUDNESS, and TONE) can be used when this switch is in the OFF (■) position.  
When set to the ON (▲) position, the above controls are by-passed and the signals are input directly to the volume control circuit, providing high quality sound.
- ⑤ VOLUME (Volume Control)**  
This knob controls the overall volume level.  
Turn the knob to the right (▲) to raise the volume and to the left (▼) to lower it.
- ⑥ BALANCE (Balance Control)**  
This knob is used to adjust the balance between the left and right channels. When it is set to the center position, the amplitude of the amplifier is equal on both sides. If there is a difference in the left and right channel output voltages or a cartridge, move the knob to the left and the right to adjust it. If the volume on the right side is too low, turn the knob to the right (▲). If the volume on the left side is too low, turn the knob to the left (▼). This will achieve an even balance on the left and right sides.
- ⑦ BASS (Bass Control)**  
This knob is used to control the bass quality of the sound. When the knob is set at the center position, the frequency characteristics are flattened in the range below 1000 Hz. The bass is emphasized as the knob is moved off center to the right (▲), and reduced as it is moved to the left (▼).
- ⑧ TREBLE (Treble Control)**  
This knob is used to control the treble quality of the sound. When the knob is set at the center position, the frequency characteristics are flattened in the range above 1000 Hz. The treble is emphasized as the knob is moved off center to the right (▲), and reduced as it is moved to the left (▼).

## ⑨ AC OUTLETS; Rear Panel Side

- For U.S.A., Canada and Multi-voltage models.  
AC outlets are used for connecting amplifier component units, such as tuner, turntable, tape deck, etc.
- SWITCHED (Total capacity: 120 W):  
These outlets are turned ON/OFF when main power switch and POWER button on the Remote Control Unit is turned on/off.
- UNSWITCHED (Capacity: 240 W):  
This outlet is always ON whether power switch is on or OFF.
- For Europe model, except the U.K. and Australia models.  
AC outlets are used for connecting amplifier component units, such as tuner, turntable, tape deck, etc.
- SWITCHED (Total capacity: 100 W):  
These outlets are turned ON/OFF when main power switch and POWER button on the Remote Control Unit is turned on/off.
- UNSWITCHED (Capacity: 100 W):  
This outlet is always ON whether power switch is on or OFF.

## RECEPTION OF RADIO PROGRAMS

1. Set the INPUT SELECTOR switch (2) to "TUNER".
2. Operate the tuner to receive a radio program.
3. Turn the volume and tone controls to yield an appropriate volume and sound quality.

## CONNECTIONS OF AUDIO EQUIPMENT TO AUX TERMINALS

1. Set the INPUT SELECTOR switch (2) to "AUX". Position.
2. Operate the Audio equipment Systems.
3. Turn the volume and tone controls to yield an appropriate volume and sound quality.

## PLAYBACK WITH TAPE DECK

1. Set the TAPE MONITOR switch (3) to "COPY/DAT/TAPE-1" or "DAT/TAPE-2".
2. Operate the Tape Deck.
3. Turn the volume and tone controls to yield an appropriate volume and sound quality.

## RECORDING WITH TAPE DECK

- The source to be recorded is selected by the INPUT SELECTOR switch (1).

## COPYING FROM ONE TAPE TO ANOTHER

- To copy from COPY/DAT/TAPE-1 to DAT/TAPE-2, press the COPY/DAT/TAPE-1 switch (2).

**NOTE:**  
Copying is not possible from DAT/TAPE-2 to COPY/DAT/TAPE-1.

## MONITORING THE RECORDING

- (If a 3-head tape deck is used, the sound being recorded can be monitored during the recording.)
- Use the TAPE MONITOR switches (2) to select the tape deck onto which the sound is being recorded.

## CAUTION

- The LED for the selected tape deck lights.

## OPERATION

### PREPARATION

1. CHECKING CONNECTIONS
  - Make sure that all the connections are proper by referring to the back panel. (Fig. 2-3)
  - Check the polarity (positive and negative) of connections, and the directivity of stereo separation (right cord to right channel terminal, and left cord to left channel terminal).

2. SETTING OF EACH KNOB
  - Turn the volume control knob (3) counterclockwise, to left.
  - Set the rotary knob to "Star" or "center position".
  - Set SOURCE DIRECT (4) to "OFF" (■).
  - Press the TAPE MONITOR switch (2) to turn the LED off.
  - Turn on the speaker selection switch for desired speaker system (A or B).

After clicking the above items, turn on the power, the amplifier is set in the ready mode in a few seconds.

## PLAYING A RECORD

1. Set the INPUT SELECTOR switch (2) to "PHONO".
2. Operate the tunable and tone controls to play the record.
3. Turn the volume and tone controls to yield an appropriate volume and sound quality.

## PLAYBACK OF CD PLAYER

1. Set the INPUT SELECTOR switch (2) to "CD".
2. Operate the CD player.
3. Turn the volume and tone controls to yield an appropriate volume and sound quality.

## PREPARATION

1. CHECKING CONNECTIONS
  - Make sure that all the connections are proper by referring to the back panel. (Fig. 2-3)
  - Check the polarity (positive and negative) of connections, and the directivity of pin cord connection.
2. SETTING OF EACH KNOB
  - Turn the volume control knob (3) counterclockwise.
  - Set the rotary knob to "Star" or "center position".
  - Set SOURCE DIRECT (4) to "OFF" (■).
  - Turn on the speaker selection switch for desired speaker system (A or B).

- Use this position when using the record player connected to the PHONO jacks. The record player should have an "MM" cartridge.

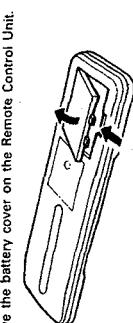
- Use this position when using the CD player, etc. connected to the CD jacks.  
Use this position when using the tuner, TUNER jacks, connected to the TUNER jacks.  
Use this position when using the component connected to the AUX jacks.

When the knob is set at the center position, the frequency characteristics are flattened in the range above 1000 Hz. The bass is emphasized as the knob is moved off center to the right (▲), and reduced as it is moved to the left (▼).

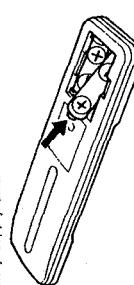
## REMOTE CONTROL OPERATION

The accessory Remote Control Unit is used to control the amplifier from a convenient distance.

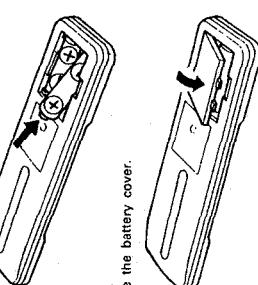
### (1) Inserting the Dry Cell Batteries



1. Remove the battery cover on the Remote Control Unit.



2. Insert two dry cell batteries as shown in the diagram on the battery supply unit.



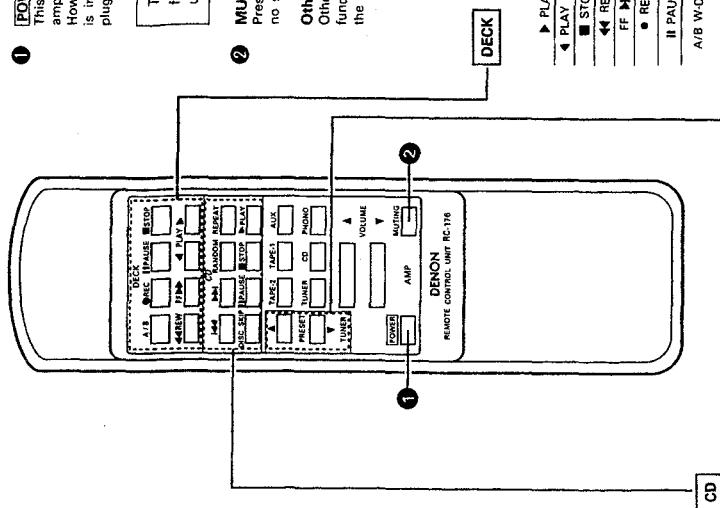
3. Replace the battery cover.

## Remote Control Unit RC-176 supplied with the PMA-525R

- ① POWER button**  
This button can be used to turn on and off the power of the amplifier.  
• The power for the amplifier turned on and off it is in the power standby mode and the power cord is plugged in.

This button will not function if there is a power failure, if the power cord is not plugged in, or when using an audio timer.

- ② MUTING button**  
Pressing this switch will deactivate the muting condition and no signals will be output to the speakers.  
**Other buttons**  
Other buttons are exclusively for the PMA-525R and function in the same way as the corresponding buttons on the set.



### Note on operation

- Do not press the operating buttons on the Amplifier and the Remote Control Unit at the same time. This will cause misoperation.
- Operation of the Remote Control Unit will become less effective or erratic if the infrared Remote Control Sensor on the Amplifier is exposed to strong light or if there are obstructions between the Remote Control Unit and the sensor.
- In case you operate a VCR, TV or other components by remote control, do not operate buttons on two different remote control units at the same time. This will cause misoperation.

**Besides being able to operate the PMA-525R amplifier with this Remote Control Unit, you can also operate a DENON cassette deck and CD player from this handy full-system Remote Control Unit.**

### Remote control section

- Full-system Remote Control Unit**  
The full-system Remote Control Unit operates all major functions of the Amplifier, such as function switching, volume control. But that's not all! The same control pads can also control the major functions of a DENON CD player and cassette deck and tuner when combined with the PMA-525R to create a remarkably ergonomic and versatile DENON system with all the quality sound reproduction that the devoted audiophile expects.

For details on operating other components, refer to the operating instructions for the CD player and/or cassette deck.

- CAUTION:**
  - If the power is turned off with the Remote Control Unit, the set is switched to the power stand-by state. If you are absent for a long period of time, unplug the power cord.
  - Only the MUTE/STANDBY LED (① lights when in the power stand-by mode.
  - You may experience erratic operation of the Remote Control Unit if it is operated in fluorescent light and direct sunlight, in particular if this light strikes the Remote Control Sensor on the Amplifier. However, this is not a malfunction, and if this should happen, simply protect the sensor against such light.

**Hinweise:** \*1 Für Europa und Mehrsozialrauma  
Note: \*1 Pour les modèles pour l'Europe et multi-tension

Note: \*For Europe and/or Orange  
\*\*For U.S.A. and Canada  
\*\*\*For the USA and Canada  
\*\*\*\*For the USA and Canada  
\*\*\*\*\*For the USA and Canada  
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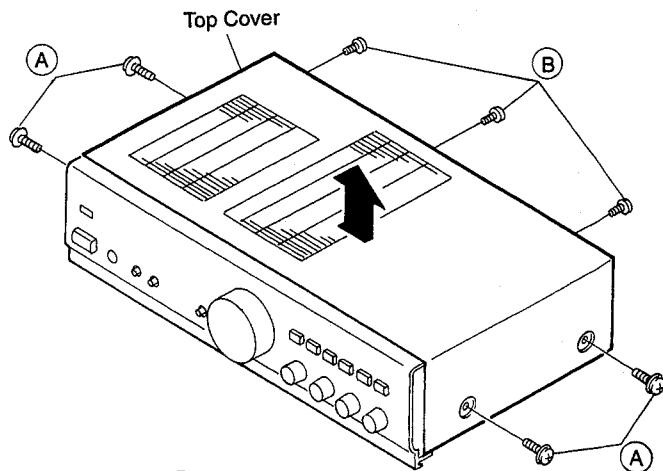
• Specifications and contents are subject to change without notice or prior notice to customers.

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## REMOVAL OF EACH SECTION

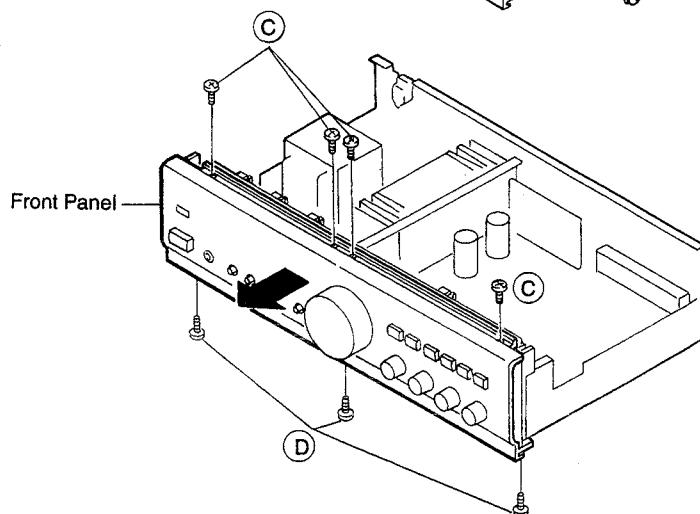
### ● Top Cover

- 1) Remove 4 screws (A) and 3 screws (B).
- 2) Pull up Top Cover in arrow direction.



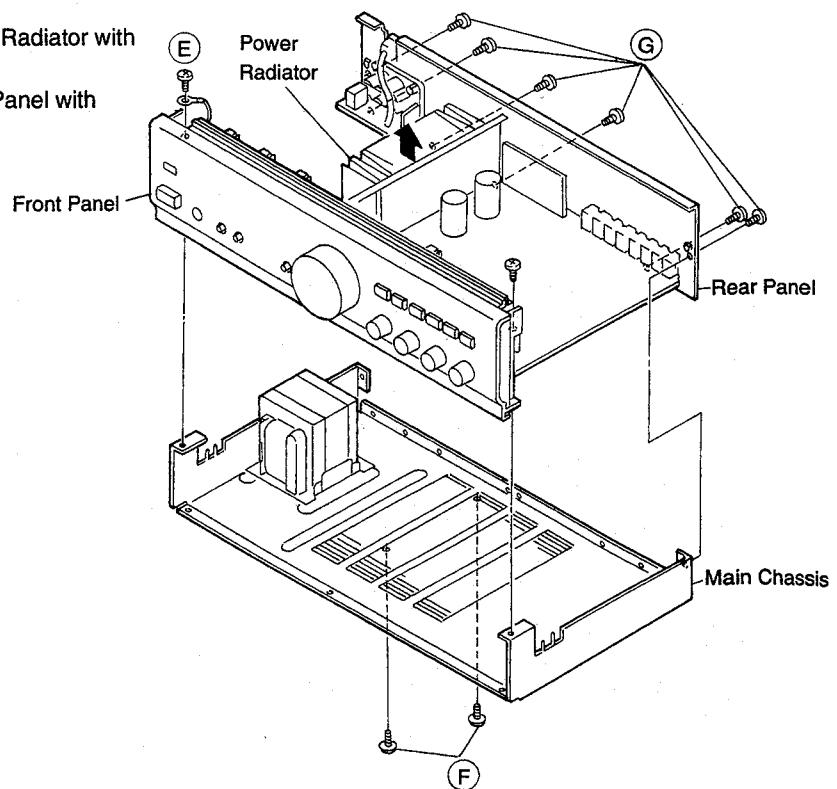
### ● Front Panel

- 1) Remove 4 screws (C).
- 2) Remove 3 screws (D).
- 3) Detach Front Panel in arrow direction.



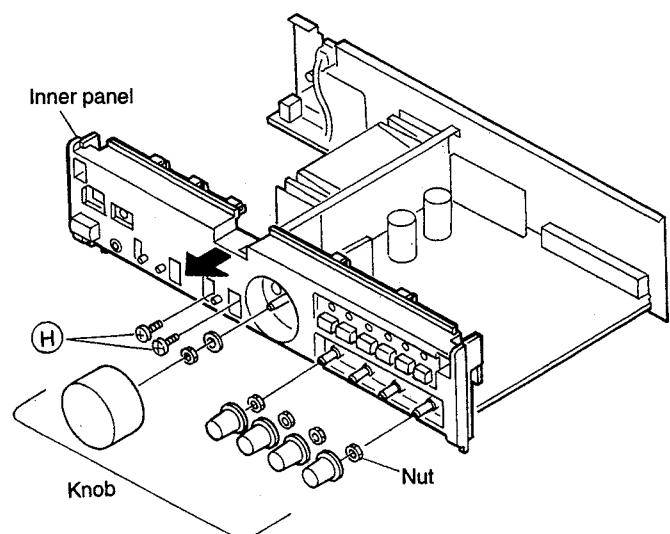
### ● Main Chassis

- 1) Remove 2 screws (E).
- 2) Remove 2 screws (F) securing Power Radiator with Main Chassis.
- 3) Remove 6 screws (G) securing Rear Panel with Main Chassis.



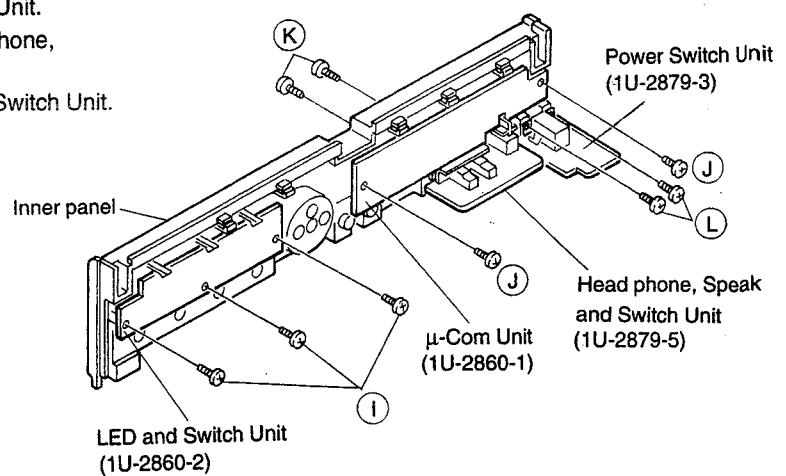
### ● Inner Panel

- 1) Remove 5 Knobs and 5 nuts.
- 2) Remove 2 screws (H), and detach Inner Panel in arrow direction.

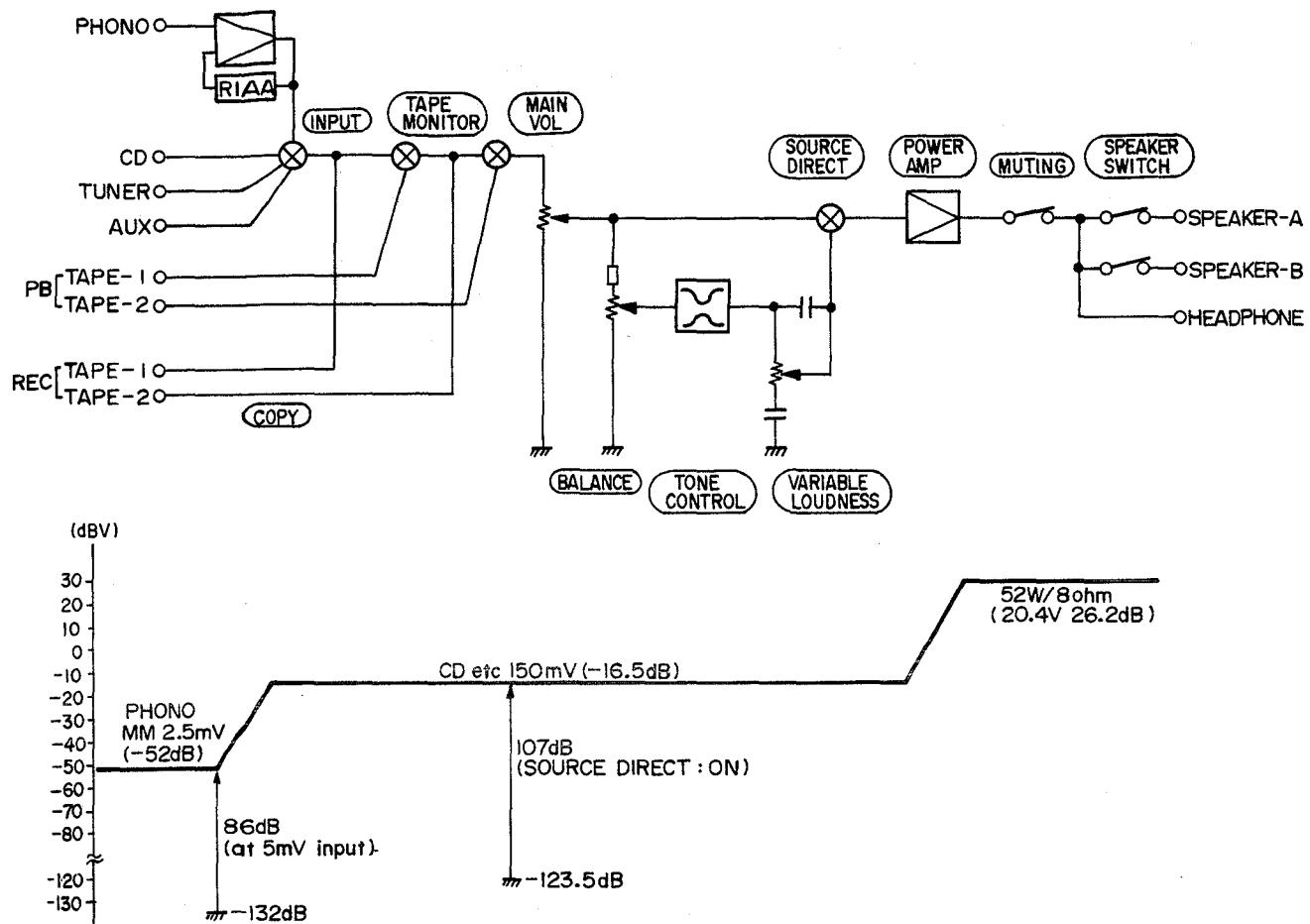


### ● Each Unit of Inner Panel

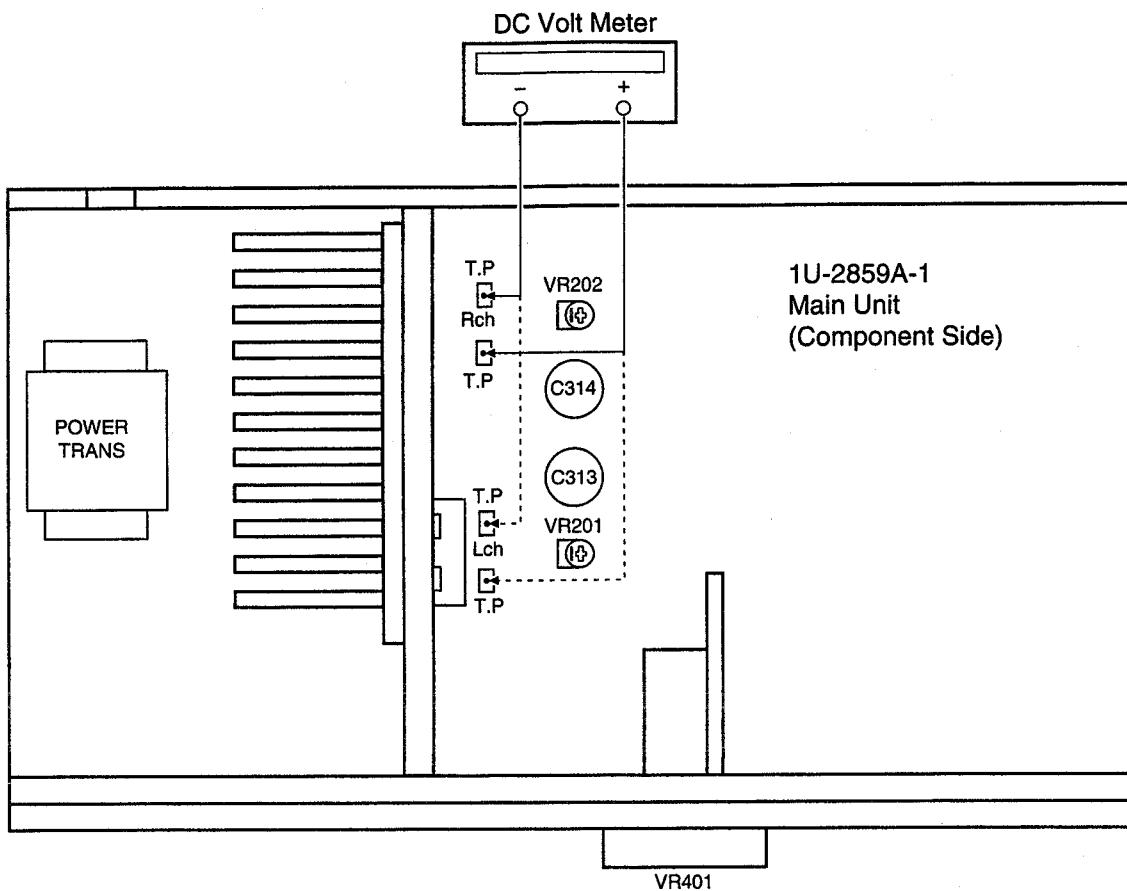
- 1) Remove 3 screws (I), and detach LED and Switch Unit.
- 2) Remove 2 screws (J), and detach μ-Com Unit.
- 3) Remove 2 screws (K), and detach Head phone, SP Switch Unit.
- 4) Remove 2 screws (L), and detach Power Switch Unit.



## BLOCK AND LEVEL DIAGRAM



## METHOD OF ADJUSTMENTS



### IDLING CURRENT

- Setup

1. Lay the unit at an ordinary position away from a direct current from a cooler or fan. Do the adjustment at a temperature between 15°C (59°F) and 30°C (86°F).

2. Set controls as follows.

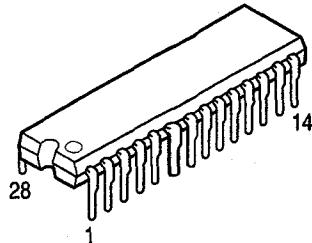
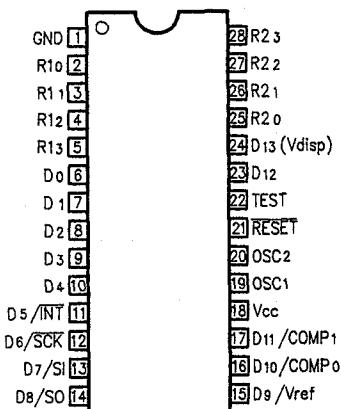
POWER SWITCH → OFF (■)

VOLUME CONTROL → fully counterclockwise. (◐) min. [Main volume (VR401) and Semifixed resistors]  
(VR201...Lch, VR202...Rch)

SPEAKER Terminals → open: do not connect the speakers, dummy load etc.

- Adjustment

1. Remove Top cover. And then connect DC Voltmeter to Test points of 1U-2859A1 (Main Unit).
2. Connect Power cord to AC wall outlet, and turn Power Switch "on" (■). Within 10 seconds turn VR201 (Lch) and VR202 (Rch) clockwise so that DC voltmeter reads  $17 \pm 3\text{mV}$  DC.
3. Then after 2 minutes warm up adjust VR201 and VR202 so that the DC Voltmeter reads  $17 \pm 3\text{mV}$  DC.
4. And after 10 minutes warm up adjust VR201 and VR202 so that the DC Voltmeter reads  $11 \pm 3\text{mV}$  DC.

**SEMICONDUCTORS****● IC's****HD404222 (IC101)****HD404222 Terminal Function**

Pin No.	Symbol	Typ	Opt	I/O	Res	Ini	Act	Det	Function
1	GND	—	—	—	—	—	—	—	Ground.
2	PHONO	B	IU	O	HZ	H	L	—	LED drive output for function indication.
3	CD	B	IU	O	HZ	H	L	—	LED drive output for function indication.
4	TUNER	B	IU	O	HZ	H	L	—	LED drive output for function indication.
5	AUX	B	IU	O	HZ	H	L	—	LED drive output for function indication.
6	VOLUME UP	B	IU	O	HZ	L	H	—	Volume drive output.
7	VOLUME DOWN	B	IU	O	HZ	L	H	—	Volume drive output.
8	NC	B	IU	I	HZ	L	—	—	Connect to ground.
9	B-DOWN	B	IU	I	HZ	H	L	Lv	Power supply stop detection input.
10	PROTECTION	B	IU	I	HZ	H	L	Lv	Protecting detection input.
11	REMOCON	B	IU	I	HZ	H	L	Ed	Remote control signal input.
12	CK	B	IU	O	HZ	L	H	—	Analog function switch control output (clock).
13	ST	B	IU	O	HZ	L	H	—	Analog function switch control output (chip select).
14	DATA	B	IU	O	HZ	L	H	—	Analog function switch control output (data).
15	VREF	—	—	—	—	—	—	—	Reference voltage input for comparator.
16	KEY IN	B	IU	I	HZ	—	—	Alg	Button signal input (analog).
17	NC	B	IU	I	HZ	L	—	—	Connect to ground.
18	Vcc	—	—	—	—	—	—	—	Power supply.
19	OSC1	—	—	I	—	—	—	—	Xtal input.
20	OSC2	—	—	O	—	—	—	—	Xtal output.
21	RESET	—	EU	I	L	H	H	—	Reset signal input.
22	—	—	—	I	—	—	—	—	—
23	POWER ON/OFF	B	IU	O	HZ	H	L	—	Power ON/OFF shift output (L: Power ON).
24	MUTING	B	IU	O	HZ	H	H	—	Mute signal output (H: mute ON).
25	NC	B	IU	O	HZ	L	—	—	Connect to ground.
26	MUTE/STANDBY	B	IU	O	HZ	H	L	—	LED drive output for Mute/Standby indication.
27	TAPE2	B	IU	O	HZ	H	L	—	LED drive output for function indication.
28	TAPE1	B	IU	O	HZ	H	L	—	LED drive output for function indication.

**Note:**

Typ (Type): B=NMOS open drain.

Opt (Option): IU=internal pull up, EU=external pull up.

Port state: Res=reset, Ini=standby, Act=active.

Det: Lv=level, Ed=edge, Alg=analog.

I/O: Port input / output for defined name (I: Input, O: Output).

Res: Show port state at reset (H: High level, L: Low level, HZ: High impedance).

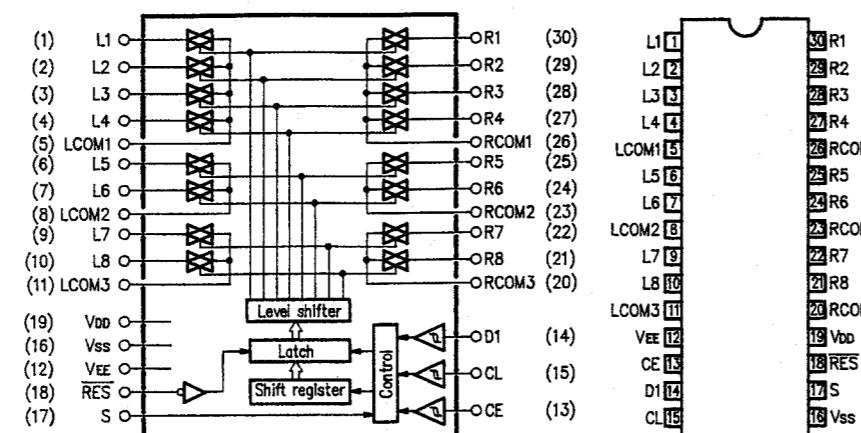
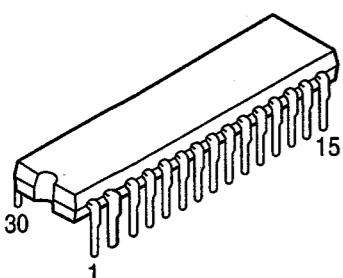
Opt: ★U: Pull up, ★D: Pull down.

Det: Show operating condition of input port (Lv: Detect level, Ed: Detect edge).

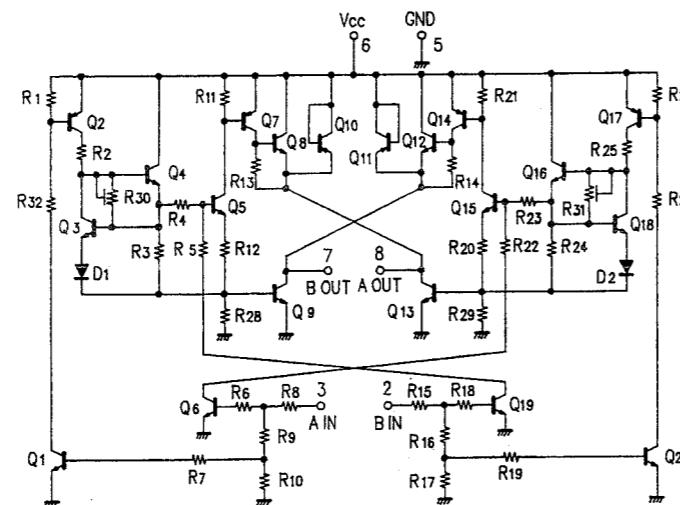
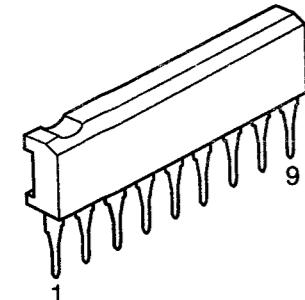
Ini: Show input / output port initialization (H: High level, L: low level).

Act: Show port state at operating.

LC7821 (IC002)

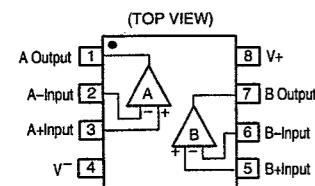
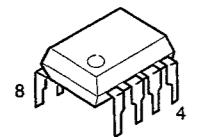


BA6208S (IC103)

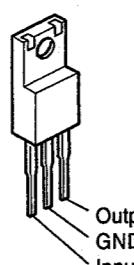


BA15218 (IC007)

NJM2068DDC (IC001, 201)



NJM7806FA (IC104)



Output  
GND  
Input

## ● TRANSISTORS

2SA988 (E/F)

2SC1815 (BL)

2SC1841 (E/F)

R1

R2

R3

R4

RCOM1

R5

R6

RCOM2

R7

R8

RCOM3

Vdd

VEE

CE

D1

RES

S

CL

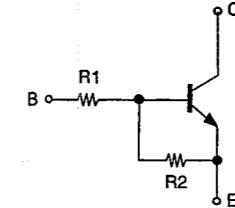
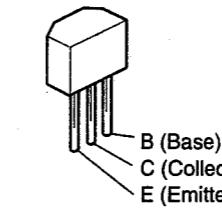
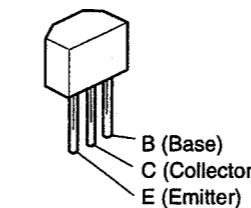
Vss

2SA1633 (E/F) (TR217,218)

2SC4278 (E/F) (TR215,216)

2SB1328 (P)

2SD2004 (P)

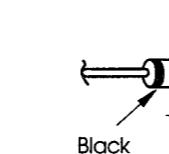
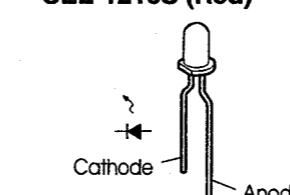
2SA933S (S)  
2SC1740S (S), (E)DTC114ES NPN  
DTC143ZSA NPN

	R1	R2
DTC114ES	10kohm	10kohm
DTC143ZSA	4.7ohm	47ohm

## ● DIODES (including LED)

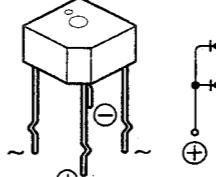
1SS252

1S2471

SEL-1810A (Orange)  
SEL-1210S (Red)

S4VB20 (D306)

1SR35-200A

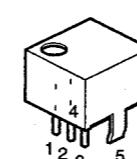
MTZ6.2A  
MTZJ18A  
MTZJ3.3A  
MTZJ27A  
MTZJ7.5C

Navy Blue

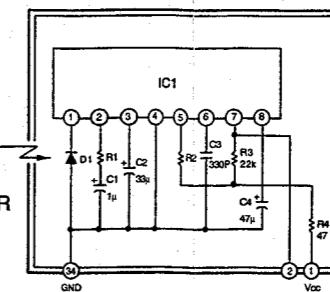
● POSISTOR  
PTH9M04BB222TS2F333  
(P401)

## ● OTHER

SBX1610-52 (Remote Control Receiver) (IC105)



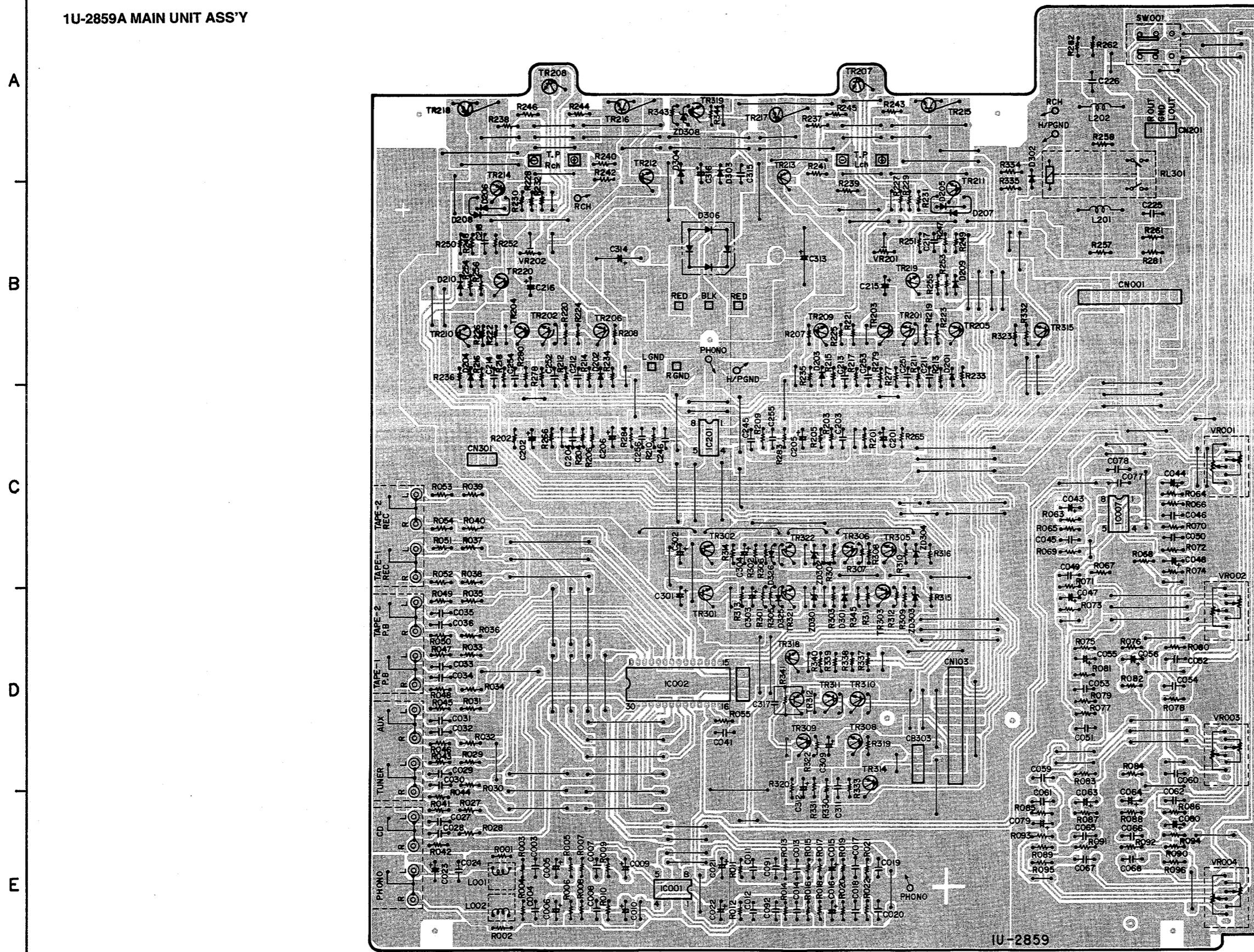
1. Vcc
2. Output
3. GND
4. Case Fin
5. Case Fin

STANDARD  
TRANSMITTER

## **PRINTED WIRING BOARD (Pattern Side)**

1 \_\_\_\_\_ 2 \_\_\_\_\_ 3 \_\_\_\_\_ 4 \_\_\_\_\_ 5 \_\_\_\_\_ 6 \_\_\_\_\_ 7 \_\_\_\_\_ 8 \_\_\_\_\_

**1U-2859A MAIN UNIT ASS'Y**

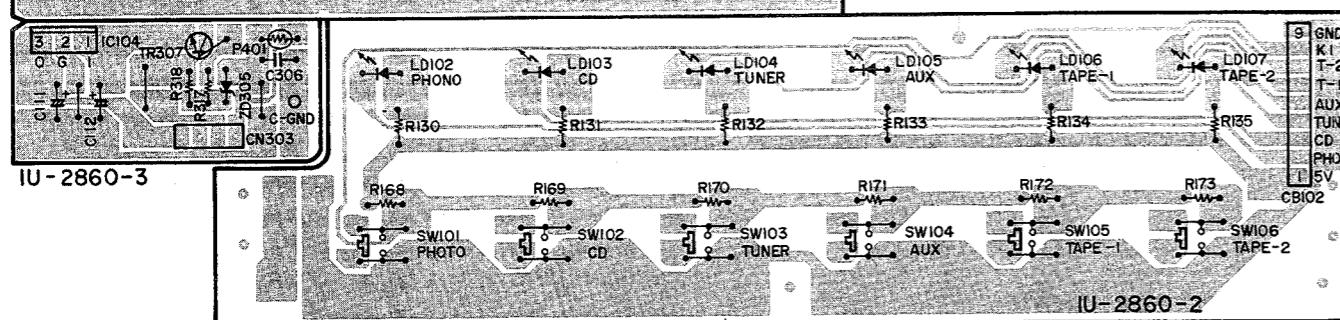
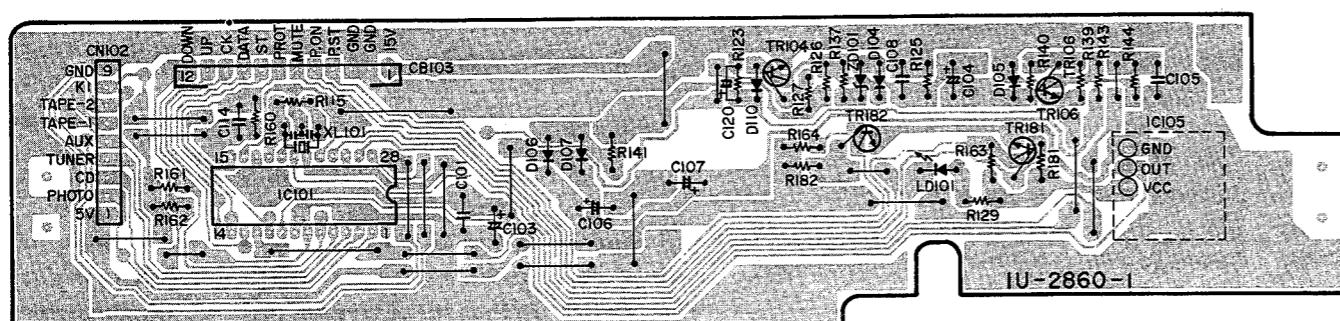


IU-28

1 2 3 4 5 6 7 8

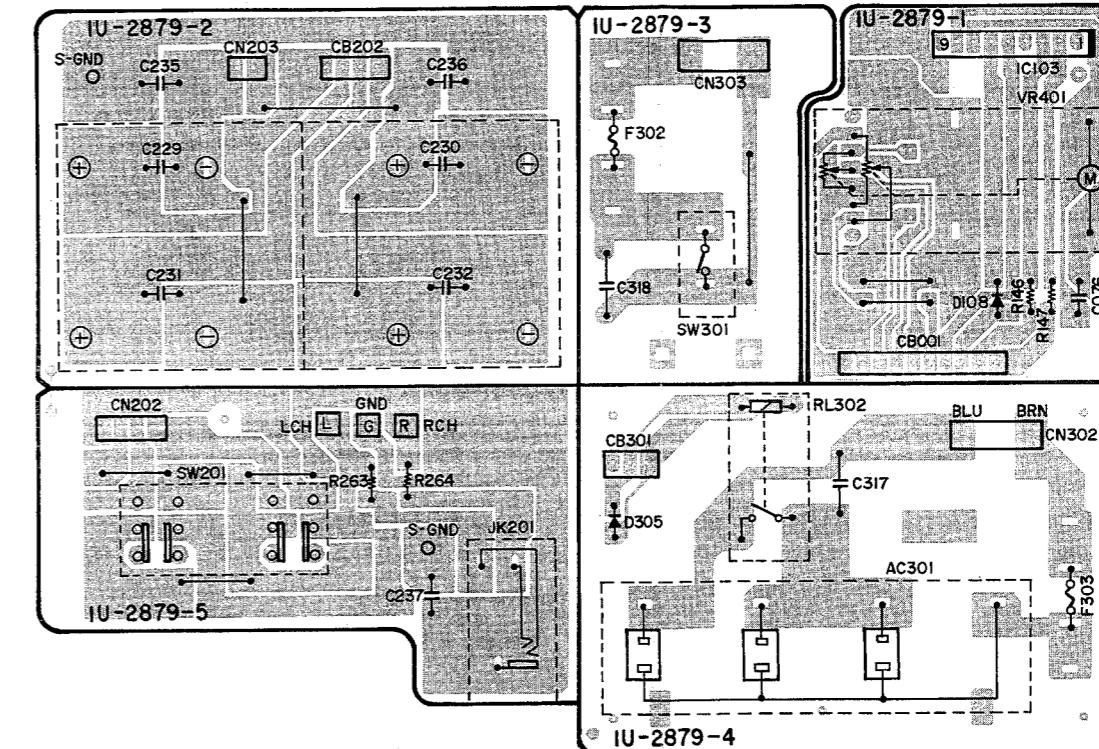
## 1U-2860A μ-COM UNIT ASS'Y

1U-2860A μ-Com Unit Ass'y	
1	μ-Com Unit
2	LED, Switch Unit
3	Regulator Unit



## 1U-2879A VOLUME UNIT ASS'Y

1U-2879 Volume Unit Ass'y	
1	Volume Unit
2	SP terminal Unit
3	Power Switch Unit
4	AC Outlet Unit
5	Head Phone, SP SW Unit



Version	Unit No.	F302	F303	F304	SP terminal	AC outlet
Black for Europe	1U-2879A	T1A/250V	T1A/250V	-	205 0952 009	203 3950 002
Gold for Europe	1U-2879A	T1A/250V	T1A/250V	-	205 0952 009	203 3950 002
U.S.A. & Canada	1U-2879D	5A/125V	8A/125V	-	2050952009	2033926007
U.K. & Australia	1U-2879E	T1A/250V	-	-	2050952009	-

A

B

C

D

E

**NOTE FOR PARTS LIST**

- Part indicated with the mark "◎" are not always in stock and possibly to take a long period of time for supplying, or in some case supplying of part may be refused.
- When ordering of part, clearly indicate "1" and "I" (i) to avoid mis-supplying.
- Ordering part without stating its part number can not be supplied.
- Part indicated with the mark "★" is not illustrated in the exploded view.
- Not including Carbon Film ±5%, 1/4W Type in the P.W.Board parts list. (Refer to the Schematic Diagram for those parts.)

**WARNING:**

Parts marked with this symbol  have critical characteristics.  
Use ONLY replacement parts recommended by the manufacturer.

**• Resistors**

Ex.: RN 14K 2E 182 G FR  
Type Shape Power Resist- Allowable Others

RD : Carbon	2B : 1/8W	F : ±1%	P : Pulse-resistant type
RC : Composition	2E : 1/4W	G : ±2%	NL : Low noise type
RS : Metal oxide film	2H : 1/2W	J : ±5%	NB : Non-burning type
RW : Winding	3A : 1W	K : ±10%	FR : Fuse-resistor
RN : Metal film	3D : 2W	M : ±20%	F : Lead wire forming
RK : Metal mixture	3F : 3W		
	3H : 5W		

\* Resistance  
1 8 2 ⇒ 1800 ohm = 1.8 kohm  
Indicates number of zeros after effective number.  
2-digit effective number.

• Units: ohm

1 R 2 ⇒ 1.2 ohm  
1-digit effective number.  
2-digit effective number, decimal point indicated by R.

• Units: ohm

**• Capacitors**

Ex.: CE 04W 1H 2R2 M BP  
Type Shape Dielectric Capacity Allowable Others

CE : Aluminum foil electrolytic	0J : 6.3V	F : ±1%	HS : High stability type
CA : Aluminum solid electrolytic	1A : 10V	G : ±2%	BP : Non-polar type
CS : Tantalum electrolytic	1C : 16V	J : ±5%	HR : Ripple-resistant type
CQ : Film	1E : 25V	K : ±10%	DL : For charge and discharge
CK : Ceramic	1V : 35V	M : ±20%	HF : For assuring high frequency
CC : Ceramic	1H : 50V	Z : +80%	U : UL part
CP : Oil	2A : 100V	-20%	C : CSA part
CM : Mica	2B : 125V	P : +100%	W : UL-CSA type
CF : Metallized	2C : 160V	-0%	F : Lead wire forming
CH : Metallized	2D : 200V	C : ±0.25pF	
	2E : 250V	D : ±0.5pF	
	2F : 500V	E : ±1pF	
	2G : 630V	= : Others	
	2J : 630V		

**\* Capacity (electrolyte only)**

2 2 2 ⇒ 2200μF  
Indicates number of zeros after effective number.  
2-digit effective number.

• Units: μF

2 R 2 ⇒ 2.2μF  
1-digit effective number.  
2-digit effective number, decimal point indicated by R.

• Units: μF

**\* Capacity (except electrolyte)**

2 2 2 ⇒ 2200pF = 0.0022μF  
(More than 2) — Indicates number of zeros after effective number.  
2-digit effective number.

• Units: pF

2 2 1 ⇒ 220pF  
(0 or 1) — Indicates number of zeros after effective number.  
2-digit effective number.

• Units: pF

• When the dielectric strength is indicated in AC, "AC" is included after the dielectric strength value.

**PARTS LIST OF P.W.B. ASS'Y****1U-2859A MAIN UNIT ASS'Y**

Ref.No.	Parts No.	Parts Name	Remarks
<b>SEMICONDUCTORS GROUP</b>			
IC001	263 0609 002	IC NJM2068DDC	
IC002	262 1227 008	IC LC7821	
IC007	263 0565 007	IC BA15218	
IC201	263 0609 002	IC NJM2068DDC	
TR201,202	273 0235 923	Transistor 2SC1841(E/F)	
TR203-206	271 0131 924	Transistor 2SA988(E/F)	
TR207,208	273 0198 918	Transistor 2SC1815(BL)	
TR209,210	273 0235 923	Transistor 2SC1841(E/F)	
TR211,212	274 0151 000	Transistor 2SD2004(P)	
TR213,214	272 0107 906	Transistor 2SB1328(P)	
TR219,220	273 0235 923	Transistor 2SC1841(E/F)	
TR301	274 0151 000	Transistor 2SD2004(P)	
TR302	272 0107 906	Transistor 2SB1328(P)	
TR303	271 0131 924	Transistor 2SA988(E/F)	
TR305	269 0160 002	Transistor DTC143ZSA	
TR306	273 0235 923	Transistor 2SC1841(E/F)	
TR308-311	273 0303 910	Transistor 2SC1740S(S)	
TR312	271 0192 905	Transistor 2SA933S(S)	
TR314	271 0131 924	Transistor 2SA988(E/F)	
TR315	273 0235 923	Transistor 2SC1841(E/F)	
TR318	269 0160 002	Transistor DTC143ZSA	
TR319	273 0303 910	Transistor 2SC1740S(S)	
TR321	273 0303 910	Transistor 2SC1740S(S)	
TR322	271 0192 905	Transistor 2SA933S(S)	
D201-204	276 0616 907	Diode 1SS252	
D205-208	276 0619 904	Diode 1S2471	
D209,210	276 0616 907	Diode 1SS252	
D301	276 0553 905	Diode 1SR35-200A	
D302	276 0616 907	Diode 1SS252	
D303,304	276 0553 905	Diode 1SR35-200A	
D306	276 0305 001	Diode S4VB20	Bridge
D325,326	276 0616 907	Diode 1SS252	
ZD301,302	276 0637 902	Zener diode MTZJ6.2A	6.2V
ZD303,304	276 0645 949	Zener diode MTZJ27A	27V
ZD308	276 0635 904	Zener diode MTZJ7.5C	7.5V
<b>RESISTORS GROUP</b>			
▲R213-216	241 2379 932	Carbon film 620 ohm 1/4W(NB)	RD14B2E621JNBS
▲R233-236	241 2377 989	Carbon film 150 ohm 1/4W(NB)	RD14B2E151JNBS
▲R237,238	244 2051 950	Metal oxide 220 ohm 1W	RS14B3A221JNBS(S)
▲R239-242	244 2043 982	Metal oxide 0.22 ohm 1W	RS14B3AR22JNBS(S)
▲R261,262	244 2043 937	Metal oxide 10 ohm 1W	RS14B3A100JNBS(S)
▲R281,282	244 2043 937	Metal oxide 10 ohm 1W	RS14B3A100JNBS(S)
Ref.No.	Parts No.	Parts Name	Remarks
▲R309,310	244 2051 958	Metal oxide 220 ohm 1W	RS14B3A221JNBS(S)
▲R315,316	241 2387 940	Carbon film 4.7 ohm 1/4W(NB)	RD14B2E4R7JNBS
▲R334	244 2052 915	Metal oxide 1.8 kohm 1W	RS14B3A182JNBS(S)
▲R335	244 2050 988	Metal oxide 2 kohm 1W	RS14B3A202JNBS(S)
▲R337,338	244 2052 902	Metal oxide 2.7 kohm 1W	RS14B3A272JNBS(S)
▲R339,340	244 2051 932	Metal oxide 3.3 kohm 1W	RS14B3A332JNBS(S)
VR001	211 0798 103	Variable resistor 100 kohm	Balance
VR002	211 0797 117	Variable resistor 30 kohm	Bass
VR003	211 0797 133	Variable resistor 10 kohm	Treble
VR004	211 0830 003	Variable resistor 100 kohm	Loudness
VR201,202	211 6064 048	Semi fixed resistor 5 kohm	V06PB502
<b>CAPACITORS GROUP</b>			
C003,004	253 1179 945	Ceramic cap. 220pF/50V	CK45B1H221K
C005,006	254 4254 909	Electrolytic 10μF/16V	CE04W1C100M
C007,008	253 1179 903	Ceramic cap. 100pF/50V	CK45B1H101K
C009,010	254 4256 952	Electrolytic 220μF/25V	CE04W1E221M
C011,012	255 1265 978	Mylar film 0.022μF/50V	CQ93M1H223J(B)
C013,014	255 1265 907	Mylar film 0.0068μF/50V	CQ93M1H682J(B)
C015,016	254 4254 909	Electrolytic 10μF/16V	CE04W1C100M
C017-020	253 1179 945	Ceramic cap. 220pF/50V	CK45B1H221K
C021-023	254 4260 948	Electrolytic 1μF/50V	CE04W1H010M
C024	253 1181 904	Ceramic cap. 0.01μF/50V	CK45F1H103Z
C027-036	253 4537 982	Ceramic cap. 56pF/50V	CC45SL1H560J
C041	255 1265 936	Mylar film 0.01μF/50V	CQ93M1H103J(B)
C043,044	254 4254 909	Electrolytic 10μF/16V	CE04W1C100M
C045,046	253 1179 903	Ceramic cap. 100pF/50V	CK45B1H101K
C047,048	254 4254 938	Electrolytic 47μF/16V	CE04W1C470M
C049,050	253 1179 903	Ceramic cap. 100pF/50V	CK45B1H101K
C051,052	255 1264 940	Mylar film 0.0022μF/50V	CQ93M1H222J(B)
C053,054	256 1035 907	Metalized 0.18μF/50V	CF93A1H184J
C055,056	254 4260 948	Electrolytic 1μF/50V	CE04W1H010M
C059,060	255 1265 949	Mylar film 0.012μF/50V	CQ93M1H123J(B)
C061,062	256 1034 940	Metalized 0.056μF/50V	CF93A1H563J
C063,064	254 4260 922	Electrolytic 0.33μF/50V	CE04W1HR33M
C065,066	253 1179 990	Ceramic cap. 560pF/50V	CK45B1H561K
C067,068	255 1265 978	Mylar film 0.022μF/50V	CQ93M1H223J(B)
C077,078	253 1181 904	Ceramic cap. 0.01μF/	

## 1U-2860A μ-COM UNIT ASS'Y

Ref.No.	Parts No.	Parts Name	Remarks	
C245,246	253 4537 982	Ceramic cap. 56pF/50V	CC45SL1H560J	
C251~254	255 1264 982	Mylar film 0.0047μF/50V	CQ93M1H472J(B)	
C255,256	253 4537 924	Ceramic cap. 33pF/50V	CC45SL1H330J	
C301,302	254 4260 948	Electrolytic 1μF/50V	CE04W1H010M	
C303,304	254 4260 980	Electrolytic 10μF/50V	CE04W1H100M	
C309	254 4250 945	Electrolytic 330μF/6.3V	CE04W0J331M	
C311	253 1181 904	Ceramic cap. 0.01μF/50V	CK45F1H103Z	
C312	254 4256 936	Electrolytic 47μF/25V	CE04W1E470M	
C313,314	254 6197 006	Electrolytic 8200μF/56V	CE68W=822MC(DL)	
C315	256 1042 903	Metallized 0.1μF/250V	CF93A2E104K	
C316	254 4263 916	Electrolytic 0.22μF/100V	CE04W2AR22M	
C317	253 9039 906	BC Ceramic cap. 0.1μF/25V	CK45=1E104Z	
<b>OTHER GROUP</b>				<b>Q'ty</b>
L001,002	-	(P.W.board)		(1)
L201,202	235 9003 002	FTZ choke coil		2
	235 0104 007	Inductor 1 μH		2
SW001	212 9520 003	1 p push switch	S.Direct	1
RL301	214 0129 001	Relay(DH2TU)		1
	204 8497 000	4 p pin jack(GND)(K)		4
CN001	205 0666 007	10 p conn. base(9130)		1
	205 0233 045	4 p EH Connector Base		1
	203 5114 008	3 p SCN-SCN Connector Cord		1
	203 5115 007	3 p SCN Connector Cord		1
	205 0233 032	3 p EH Connector Base		1
	203 0632 022	1 p SIN Cord Ass'y		1
	203 0632 006	1 p SIN Cord Ass'y		1
	203 0632 019	1 p SIN Cord Ass'y		1
	205 0275 029	12 p EH Connector Base		1
EP- 5667 H2	Terminal		L=20	10
415 0309 071	PVC tube (L=10)		for TR207,208	4

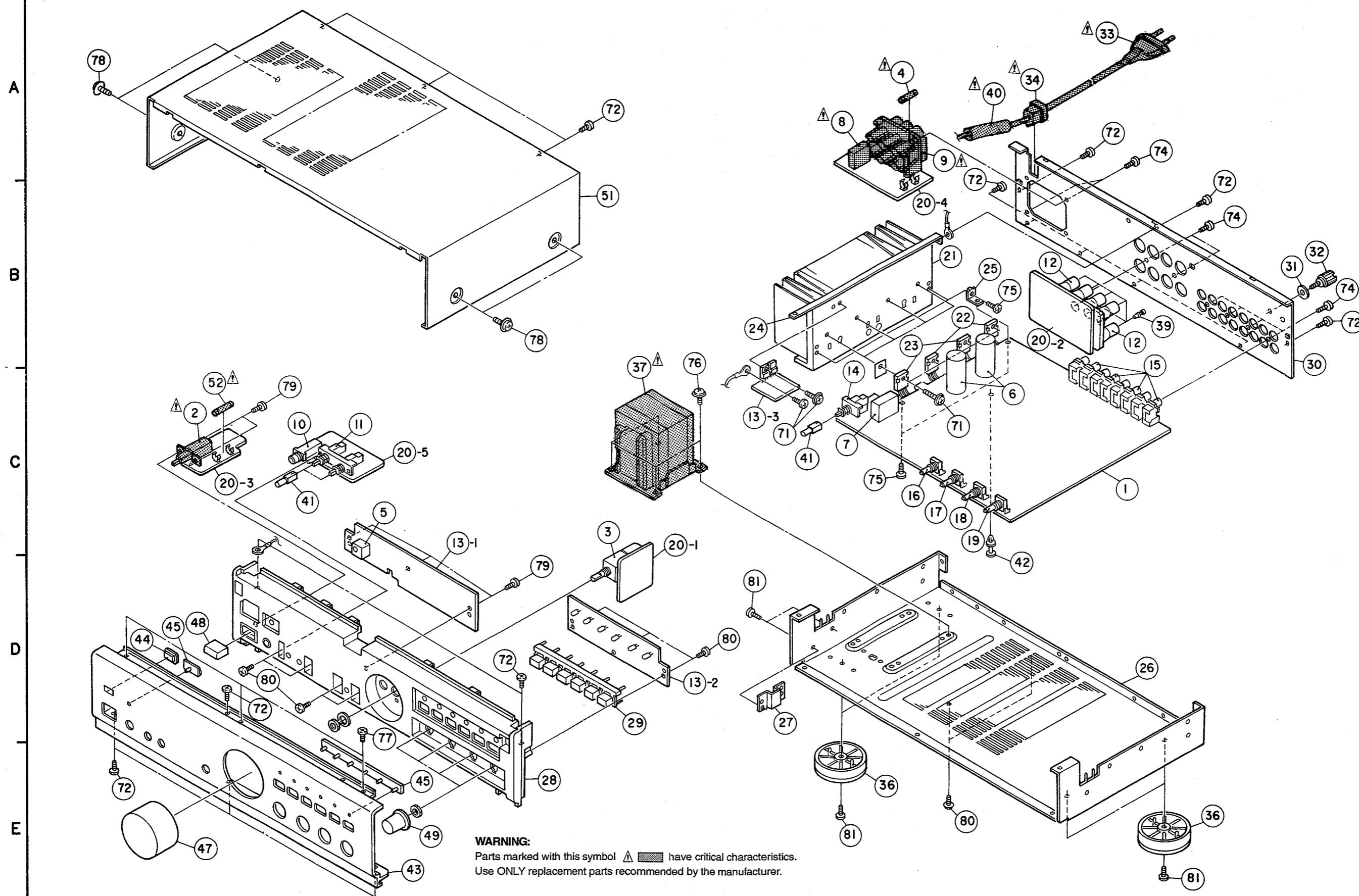
Ref.No.	Parts No.	Parts Name	Remarks	
<b>SEMICONDUCTORS GROUP</b>				
IC101	262 2168 001	IC HD404222	μ-com	
IC104	263 0793 002	IC NJM7806FA(S)	Regulator +6V	
IC105	499 0150 008	IC SBX1610-52	Remocon sensor	
TR104	269 0020 906	Transistor DTC114ES	Built in resistor	
TR106	273 0388 906	Transistor 2SC1740S(E)		
TR181,182	269 0160 002	Transistor DTC143ZSA	Built in resistor	
TR307	274 0120 002	Transistor 2SD1762(E/F)		
D104,105	276 0616 907	Diode 1SS252		
D106,107	276 0553 905	Diode 1SR35-200A		
D110	276 0616 907	Diode 1SS252		
ZD101	276 0634 905	Zener diode MTZJ3.3A	3.3V	
ZD305	276 0645 907	Zener diode MTZJ18A	18V	
LD101	393 9453 903	LED SEL1810A	Orange	
LD102~107	393 9434 906	LED SEL1210S	Red	
P401	279 0034 067	Posistor PTH9M04BB22TS2F333		
<b>RESISTORS GROUP</b>				
△R141	241 2387 940	Carbon Film 4.7 ohm 1/4 W(NB)	RD14B2E4R7JNBS	
C101	253 1181 904	Ceramic cap. 0.01μF/50V	CK45F1H103Z	
C103	254 4250 929	Electrolytic 100μF/6.3V	CE04W0J101M	
C104	254 4260 058	Electrolytic 2.2μF/50V	CE04W1H2R2H	
C105	256 1034 982	Metallized 0.12μF/50V	CF93A1H124J	
C106	254 4250 932	Electrolytic 220μF/6.3V	CE04W0J221M	
C107	254 4250 084	Electrolytic 3300μF/6.3V	CE04W0J332M	
C108	255 1265 936	Mylar Film 0.01μF/50V	CQ93M1H103J(B)	
C111,112	254 4260 948	Electrolytic 1μF/50V	CE04W1H010M	
C114	253 9039 906	BC Ceramic cap. 0.1μF/25V	CK45=1E104Z	
C120	254 4260 919	Electrolytic 0.22μF/50V	CE04W1HR22M	
C306	253 1181 904	Ceramic cap. 0.01μF/50V	CK45F1H103Z	
<b>OTHER GROUP</b>				<b>Q'ty</b>
SW101~106	-	(P.W.board)		(1)
XL101	212 4789 001	Tact switch(kyung)		6
	399 0191 903	Ceramic resonator	CST4.00MGW-TF01	1
	415 0309 026	PVC tube (L=20)	for P401	2
	205 0233 090	9 p EH Conector Base		1
	205 0275 029	12 p EH Conector Base		1
	204 2747 002	9 p EH-SCN Connector Cord		1
	203 6475 005	4 p EH-SCN Connector Cord		1
	203 0633 018	1 p Contact Ass'y		1

## 1U-2879 VOLUME UNIT ASS'Y

Ref.No.	Parts No.	Parts Name	Remarks	
<b>SEMICONDUCTORS GROUP</b>				
IC103	263 0927 001	IC BA6208S		
D108	276 0616 907	Diode 1SS252		
D305	276 0616 907	Diode 1SS252		
<b>RESISTORS GROUP</b>				
△R263,264	244 2052 931	Metal oxide 390 ohm 1W	RS14B3A391JNBS(S)	
VR401	211 0857 002	Variable resister 100 kohm	Main	
<b>CAPACITORS GROUP</b>				
C076	253 1181 904	Ceramic cap. 0.01μF/50V	CK45F1H103Z	
C229~232	255 1264 982	Mylar film 0.0047μF/50V	CQ93M1H472J(B)	
C235,236	253 1181 904	Ceramic cap. 0.01μF/50V	CK45F1H103Z	
C237	253 9039 906	BC Ceramic cap. 0.1μF/25V	CK45=1E104Z	
△C317,318	256 8003 713	Ceramic cap. 4700pF/400V	CK45E2GAC472MC	
<b>OTHER GROUP</b>				<b>Q'ty</b>
SW201	-	(P.W.board)		(1)
SW201	212 4778 009	2 p push switch	Speaker	1
△SW301	212 1030 009	Power switch (TV-5)	Power	1
△RL302	214 0142 004	Relay(TV-5)		1
△F302	206 1015 058	Fuse 1.6A		1
△F303	206 1015 029	Fuse 1 A T		1
	202 0022 008	Fuse Holder		4
	204 8503 004	Headphone jack(K)		1
	205 0952 009	4 p sp terminal		2
	203 3950 002	3 p AC outlet		1
CB001	205 0667 006	10 p conn. base-L(9130)		1
CN302,303	205 0692 000	2 p wrapping terminal		2
EP-5667 H2	Terminal		L=20	3
415 0299 000	Capacitor Cover		for C317, 318	2
203 0633 005	1 p Contact Ass'y			2
203 2375 002	2 p SCN Conn, Cord			1
203 6476 004	4 p SCH-SCH Conn, Cord			1
203 5116 006	3 p EH-SCN Conn, Cord			1

## EXPLODED VIEW OF CHASSIS AND CABINET

1 1 2 1 3 1 4 1 5 1 6 1 7 1 8



## WARNING:

Parts marked with this symbol have critical characteristics.  
Use ONLY replacement parts recommended by the manufacturer.

## PARTS LIST OF EXPLODED VIEW

Ref.No.	Parts No.	Parts Name	Remarks	Q'ty	Ref.No.	Parts No.	Parts Name	Remarks	Q'ty
◎ 1	1U-2859 A	Main unit Ass'y		1s		113 1745 110	:Push button (Round)	Gold model	3
△ 2	212 1030 009	Power switch (TV-5)		1	◎ 42	412 1979 029	P.C.B. holder		1
3	211 0857 002	Variable resistor 100 kohm	Main VR401	1	43	144 2456 101	:Front panel	Black model	1
△ 4	206 1015 029	Fuse 1A(T)	F303	1	44	144 2456 114	:Front panel	Gold model	1
5	499 0150 008	Remocon sensor SBX1610-52	IC105	1	45	143 9181 007	:Remocon window		1
6	254 6197 006	Chemicon 8200μF/56 V	C313,314	2	★ 46	445 8004 007	Wire clamer		10
7	214 0129 001	Relay (DH2TU)	RL301	1	47	112 0761 008	:VR knob	Black model	1
△ 8	214 0142 004	Relay (TV-5)	RL302	1		112 0761 011	:VR knob	Gold model	1
△ 9	203 3950 002	3p AC outlet		1	48	113 1738 101	:Power button	Black model	1
10	204 8503 004	:Headphone jack		1		113 1738 114	:Power button	Gold model	1
11	212 4778 009	2p push switch	Speaker SW201	1	49	112 0762 007	:Knob(Round)	Black model	4
12	205 0952 009	4p speaker terminal		2		112 0762 010	:Knob(Round)	Gold model	4
◎ 13	1U-2860 A	μ-com unit Ass'y		1s	★ 50	412 2814 015	Card spacer (L=14)		2
13-1	-	μ-com unit		(1)	51	102 0567 001	:Top cover	Black model	1
13-2	-	LED & switch unit		(1)		102 0567 014	:Top cover	Gold model	1
13-3	-	Regulator unit		(1)	△ 52	206 1015 058	Fuse 1.6A	F302	1
14	212 9520 003	1p push switch	S.Direct SW001	1	★ 53	513 2433 003	Serial No. Sheet		1
15	204 8497 000	4p pin jack(GND)(K)			54				
16	211 0798 103	Variable resistor 100 kohm	Balance VR001	1	55				
17	211 0797 117	Variable resistor 30 kohm	Bass VR002	1					
18	211 0797 133	Variable resistor 10 kohm	Treble VR003	1					
19	211 0830 003	Variable resistor 100 kohm	Loudness VR004	1					
◎ 20	1U-2879	Volume unit Ass'y		1s					
20-1	-	Volume unit		(1)	71	473 8007 009	Cup screw 3×12		7
20-2	-	SP terminal unit		(1)	72	473 7015 018	Tapping screw(S)3×8 Black		14
20-3	-	Power switch unit		(1)	73	-	-		
20-4	-	AC outlet unit		(1)	74	477 0064 107	Fixing screw		10
20-5	-	Headphone,sp sw unit		(1)	75	473 7002 018	Tapping screw(S)3×8		8
21	417 0519 003	:Power radiator		1	76	473 7004 016	Tapping screw(S)4×6		6
22	271 0283 005	Transistor 2SA1633 (E/F)	TR217,218	2	77	473 7508 017	Tapping screw(P)3×10 Black		3
23	273 0443 003	Transistor 2SC4278 (E/F)	TR215,216	2	78	477 0263 005	3 P Swelling screw	Black model	4
24	412 3999 007	:Radiator bracket		1		477 0263 018	3 P Swelling screw	Gold model	4
25	412 4000 005	:P.W.B. bracket(A)		2	79	473 7508 004	Tapping screw(P)3×6 Black		2
26	411 0941 505	:Chassis		1	80	473 7500 044	Tapping screw(P)3×8 Black		12
◎ 27	412 4001 004	:Side bracket		1	81	473 7002 034	Tapping screw(S)3×6 Black		7
◎ 28	146 1572 105	:Inner panel	Black model	1	82				
	146 1572 118	:Inner panel	Gold model	1					
29	113 1739 003	:Function button	Black model	1					
	113 1739 016	:Function button	Gold model	1					
◎ 30	105 1169 203	:Rear panel		1	101	GEN 3213	Envelope sub. Ass'y		1s
31	477 0018 001	Washer (P-87)		1	101-1	505 8006 019	Envelope		(1)
32	205 0071 016	Terminal Ass'y	GND	1	101-2	511 2774 009	:Inst. manual	E,G,F,I,ES,NL,S,PO	(1)
△ 33	206 2063 009	AC cord with plug		1	101-3	499 0277 004	Remote control	RC-176	(1)
△ 34	445 0056 008	Cord bush		1	101-4	-	Batteries		(2)
★ 35	513 1144 005	Masking sheet		1	102	505 8092 010	Laminate envelope		1
36	104 0282 007	:Foot Ass'y		4	103	503 1191 103	:Cushion		2
△ 37	233 6173 007	:Power trans.		1	104	501 1889 008	:Carton case		1
★ 38	475 1175 002	:Washer		1	105	513 9111 001	Color label (Gold)	Gold model only	2
39	477 0096 007	Push rivet		8	106				
△ 40	415 0364 032	U.L tube (ø8.3)	for AC cord	1					
41	113 1745 107	:Push button (Round)	Black model	3					

## NOTE FOR PARTS LIST

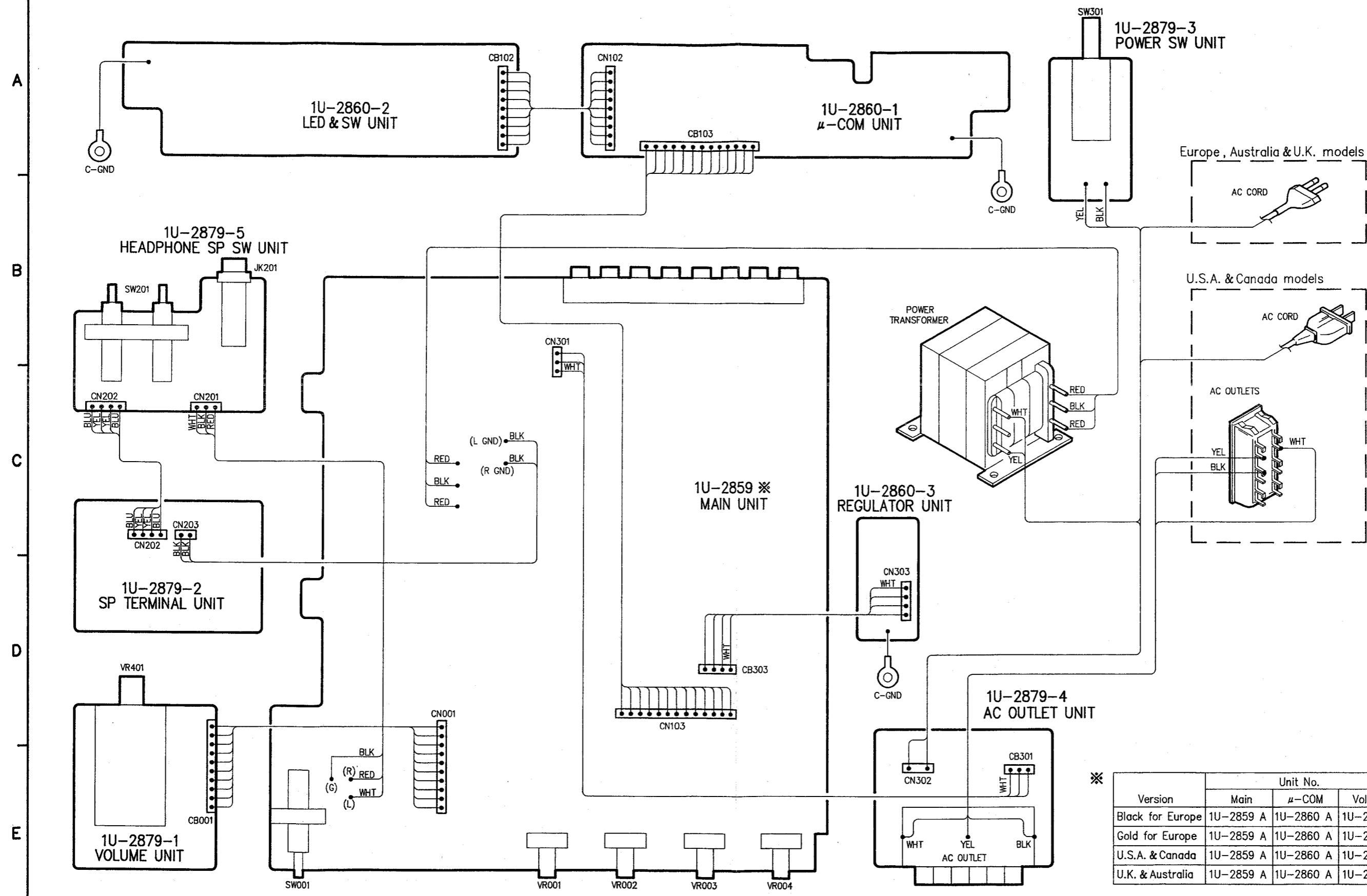
- Part indicated with the mark "◎" are not always in stock and possibly to take a long period of time for supplying, or in some case supplying of part may be refused.
- When ordering of part, clearly indicate "1" and "I" (i) to avoid mis-supplying.
- Ordering part without stating its part number can not be supplied.
- Part indicated with the mark "★" is not illustrated in the exploded view.

## WARNING:

Parts marked with this symbol △ have critical characteristics.  
Use ONLY replacement parts recommended by the manufacturer.

## WIRING DIAGRAM

1 1 2 1 3 1 4 1 5 1 6 1 7 1 8



Version	Unit No.		
	Main	μ-COM	Volume
Black for Europe	1U-2859 A	1U-2860 A	1U-2879 A
Gold for Europe	1U-2859 A	1U-2860 A	1U-2879 A
U.S.A. & Canada	1U-2859 A	1U-2860 A	1U-2879 D
U.K. & Australia	1U-2859 A	1U-2860 A	1U-2879 E

## **SCHEMATIC DIAGRAM**

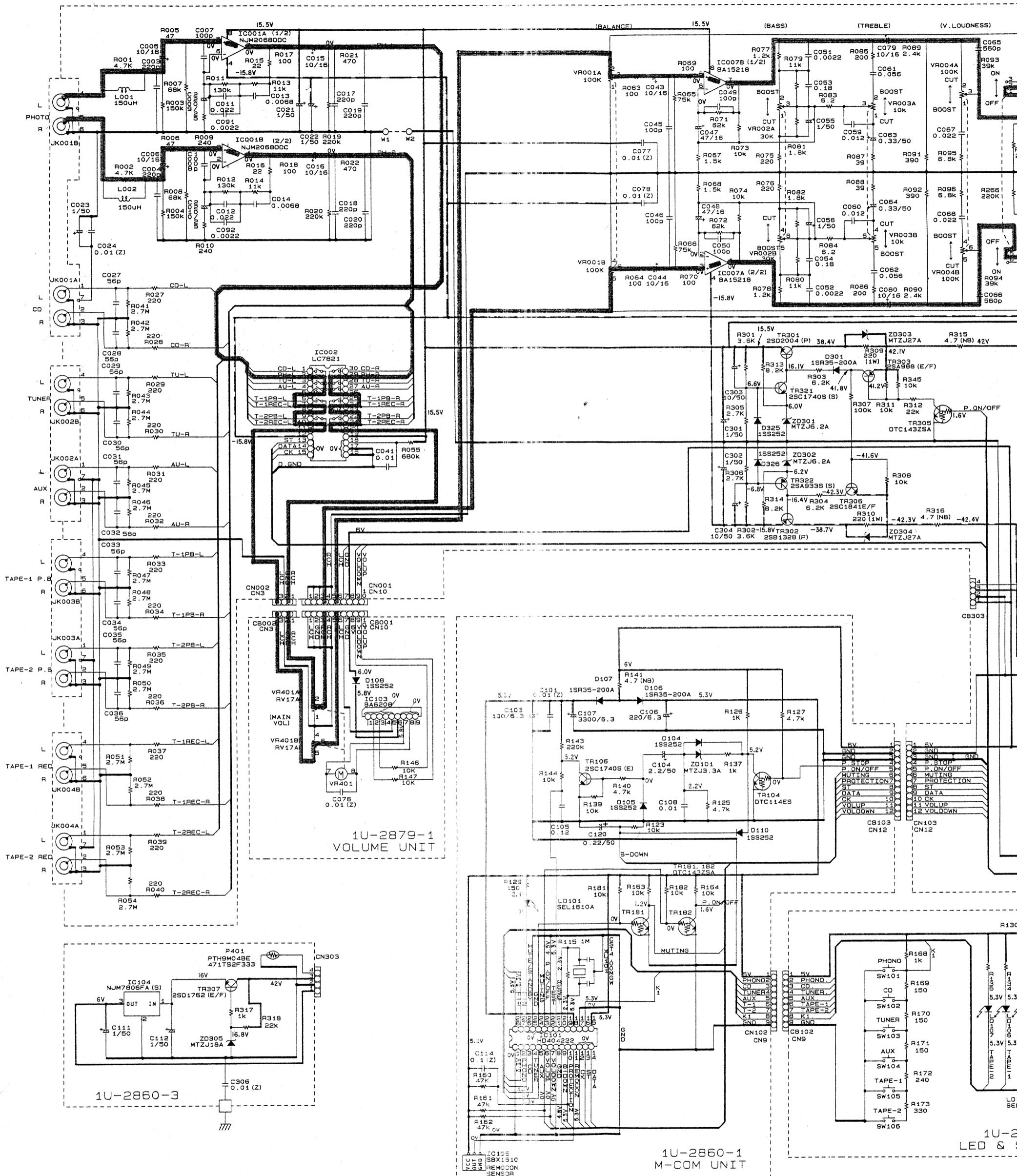
1

2

3

4

6



**WARNING:**

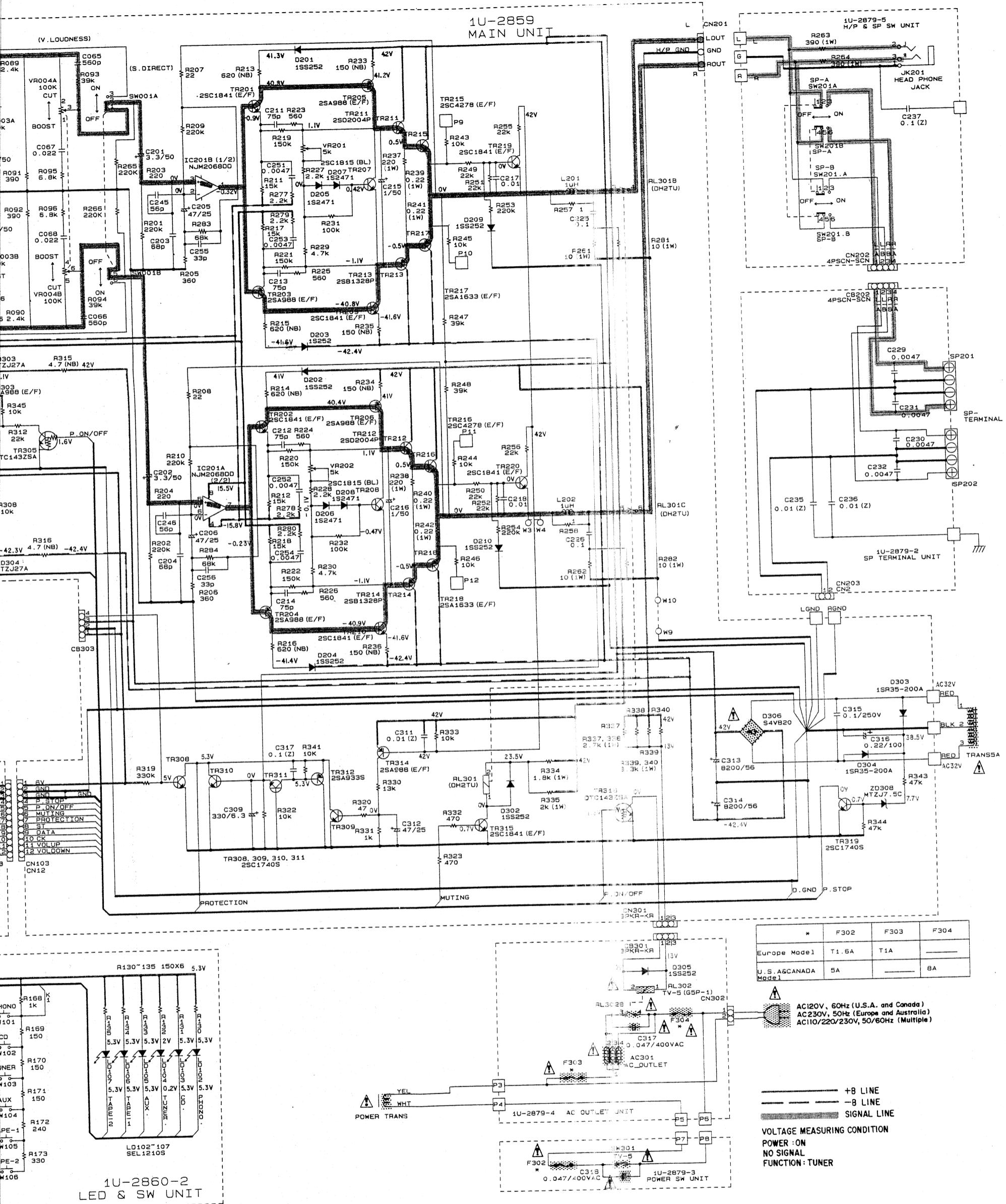
**WARNING:** Parts marked with this symbol  Use ONLY replacement parts recommended.

**CAUTION:**

**CAUTION:** Before returning the unit to the customer, current exceeds 0.5 millamps, or if the

**WARNING:**

**REMARKS:**



**WARNING:**  
Parts marked with this symbol have critical characteristics.  
Use ONLY replacement parts recommended by the manufacturer.

**CAUTION:**  
Before returning the unit to the customer, make sure you make either (1) a leakage current check or (2) a line to chassis resistance check. If the leakage current exceeds 0.5 millamps, or if the resistance from chassis to either side of the power cord is less than 240 kohms, the unit is defective.

**WARNING:**  
DO NOT return the unit to the customer until the problem is located and corrected.

**REMARKS:**  
Current and Parts are subject to change without prior notice.

**NOTES**  
ALL RESISTANCE VALUES IN OHM. k=1,000 OHM, M=1,000,000 OHM  
ALL CAPACITANCE VALUES IN MICRO FARAD. P=MICRO-MICRO FARAD  
EACH VOLTAGE AND CURRENT ARE MEASURED AT NO SIGNAL INPUT CONDITION.  
CIRCUIT AND PARTS ARE SUBJECT TO CHANGE WITHOUT PRIOR NOTICE.